DESIGN MEMORANDUM
ON IMPROVEMENT DREDGING IN
NORTH COVE, OLD SAYBROOK, CONNECTICUT

(CONNECTICUT RIVER BELOW HARTFORD)

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASSACHUSETTS

March 1965

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASS. 02154

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.

NEDED-R

2 April 1965

SUBJECT: Design Memorandum on North Cove, Old Saybrook, Connecticut (Connecticut River below Hartford, Connecticut)

TO: Chief of Engineers
ATTN: ENGCW-E

1. There are submitted herewith for review and approval five (5) copies of the Design Memorandum on the subject project in accordance with Paragraph 2 of 1st Indorsement to Hampton Beach Design Memorandum. The work to be undertaken involves dredging operations with no special design or excavation problems.

2. Planning on this project is about 90% complete. Assurances that the requirements of local cooperation will be met have been received from the State of Connecticut. Assurances from the Town of Old Saybrook are expected within a week. The requirements of local cooperation, including the cash contribution, will be completed before bids are taken for this project.

3. The plans and specifications have been prepared in accordance with the Design Memorandum. Copies of the plans and specifications will be forwarded to the Chief of Engineers at the time of advertisement for bids for the contract work. Present scheduling calls for advertising 8 April, and for bids to be received 29 April.

4. Funds in the amount of $587,000 for construction of the project were allotted for the current fiscal year.

5. The matter of approval of design memoranda prepared in the New England Division for simple dredging projects was discussed at length some years ago with Mr. Hearn, Assistant Chief of the Engineering Division, Office, Chief of Engineers. At that time, the policy was established that design memoranda on simple dredging projects would be approved in the New England Division, but any design memoranda involving

design of structures would be approved by the Chief of Engineers. The design memorandum for Hampton Beach, by error, was approved in the New England Division. It is suggested that the policy described herein be continued, and that design memoranda containing design of the structures, without fail, be submitted to the Chief of Engineers for approval.

Incl (quint)
as

E. J. RIBBS
Colonel, Corps of Engineers
Acting Division Engineer

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
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DESIGN MEMORANDUM
ON
NORTH COVE, OLD SAYBROOK, CONN.
(CONNECTICUT RIVER BELOW HARTFORD, CONN.)

PERTINENT DATA

1. A summary of the physical features and costs of the existing project for North Cove, Old Saybrook, Connecticut is as follows:

Features	Present Estimate (1965)
Dredge a channel, 11 feet deep and 100 feet wide from deep water in Conn. River connected to an anchorage having an area of about 12 acres with a depth of 11 feet and an anchorage of about 17 acres having a depth of 6 feet	$645,500

PROJECT AUTHORIZATION

2. The uncompleted modification for the improvement of Connecticut River below Hartford, Connecticut, which pertains to North Cove, Old Saybrook, Connecticut, was authorized by the River and Harbor Act of 1945. The project, as authorized, provides for dredging an entrance channel about 1900 feet in length, 100 feet wide, and 11 feet deep at mean low water, leading to an anchorage of the same depth, about 900 feet long by 650 feet wide and about 12 acres in area, beyond which is an anchorage 6 feet deep, 1150 feet long by 650 feet wide and 17 acres in area, extending nearly to the west shore.

3. The project modification was authorized provided that prior to construction local interests agree to:

a. Contribute in cash $67,500.

b. Provide without cost to the United States, all necessary lands, easements, and rights-of-way needed for the construction and maintenance of the project.

c. Provide a suitable public landing in the Cove.

d. Hold and save the United States of America free from claims for damages due to the construction and subsequent maintenance of the works.

4. There have been no general navigation improvements made by local interests.

INVESTIGATIONS

5. Physical investigations carried out in support of the preliminary examination and survey contained in House Document No. 368, 76th Congress, 1st Session, were made in July 1938 and consisted of hydrographic, topographic and probing surveys.

6. Subsequent to project authorization, data in the original report was supplemented by boring samples taken in November 1964 and hydrographic and probing surveys in December 1964 and January-February 1965.

LOCAL COOPERATION

7. The requirements of local cooperation are stated in paragraph 3 above. Formal assurances have been sent to the Selectmen of the Town of Old Saybrook and the Governor of the State of Connecticut. Signed assurances have been received from the State of Connecticut and receipt of the assurances of the Town of Old Saybrook is expected prior to completion of plans and specifications. Local people voted 255-180 on 28 October 1964 at a town meeting to approve an appropriation to cover the construction of a public landing and the local share of the dredging cost. The views and concurrence of local interests were obtained in conferences on the proposed project during the construction planning phase. The names of some of the principal officers and representatives contacted during the preconstruction planning phase are listed below:

Governor, John Dempsey, State House, Hartford, Conn.
Mr. William Wise, Director, State Water Resources Comm., Hartford, Conn.

Mr. Malcolm Smith, 1st Selectman, Old Saybrook, Conn.
Mr. James Jones, Chairman, Waterfront Advisory Comm., Old Saybrook, Conn.
Mr. Frank P. Baldi Jr., Secretary, Waterfront Advisory Comm., Old Saybrook, Conn.
Mr. Frank T. Tinsley, Chairman, Flood & Erosion Control Board, Old Saybrook, Conn.

LOCATION AND TRIBUTARY AREA

8. The Connecticut River rises in Northern New Hampshire and the Province of Quebec. It flows southerly along the border between New Hampshire and Vermont, crosses Massachusetts and Connecticut and empties into Long Island Sound at Saybrook, 14 miles west of New London and 30 miles east of New Haven. North Cove is 2 miles upriver from the jetties at Saybrook on the west side of the river. The cove lies almost entirely behind an abandoned railroad fill about 3,000 feet long and extends inland, in a somewhat semicircular form, about 3,000 feet. Across the entrance the old railroad trestle has been removed, leaving an opening of about 275 feet. Two stone filled cribbings remain in the entrance area and will be removed. The cove is tidal with tide ranges of 3.5 feet to 4.2 feet. The Town has a population of about 8,000 year round residents. During the summer, this figure is about doubled. The principal commercial activities are electronics, boat building, photographic supplies, printing, tools and dyes and food processing. The main line of the New York, New Haven & Hartford Railroad crosses the river just above North Cove. The Connecticut Turnpike is about 2 miles north of the Town. U. S. Route No. 1 passes through Old Saybrook. There are no bridges crossing over the North Cove. There are no piers or wharves in the Cove other than a few private landings for very small recreational boats.

PROJECT PLAN

9. The project plan considered the most feasible and economical to accomplish the authorized work includes the removal and disposal of all materials from an entrance channel about 1900 feet in length, 100 feet wide, and 11 feet deep at mean low water, leading to an anchorage of the same depth, about 900 feet long by 650 feet wide and about 12 acres in area beyond which is an anchorage 6 feet deep, 1150 feet long by 650 feet wide, and 17 acres in area extending nearly to the west shore.

10. The project plan involves removal of about 530,000 cubic yards of mud and sand. A one-foot allowable overdepth provides for inaccuracies in the dredging process at the specified depths. Two rock-filled cribs, in a deteriorated condition in the entrance channel, will also be removed. In view of the odoriferous and organic nature of the bulk of the material to be removed, and the opposition by fish and wildlife and conservation interests against deposition of dredged material on land spoil areas, it is proposed to specify removal by bucket dredged to an approved offshore dumping area.

DEPARTURES FROM PROJECT PLAN

11. The present project plan is the same as that recommended in the authorizing document. Minor alteration of the entrance channel may be necessary to provide the best alignment into the cove. Also, the 6 foot anchorage may be shifted slightly to accommodate the location of the Town Landing when it is firmly established.

COST ESTIMATES

12. The estimate of project cost determined in the authorizing documents was based on probings and hydrographic surveys made in 1938 during the study phase and indicated that the materials to be removed consisted of sand, mud and gravel. It was estimated that 540,000 cubic yards of ordinary material would be required to be removed from within the project limits. Volumes were in terms of place measurement and included an allowance of 1 foot overdepth, with side slopes of 1 on 3.

13. The current estimate of cost is based on quantities determined by detailed soundings, borings and probing surveys made in November and December 1964 and February 1965 and includes an allowance of one foot overdepth dredging to provide for inaccuracies in the dredging operation. The present estimate of cost is based on disposal at sea.

14. Current Estimate of Cost (March 1965)

09	Channels	
	Dredging 11 foot entrance channel and 6 and 11 foot anchorages (530,000 c.y. ordinary materials @ .94/c.y.	$500,000

Current Estimate of Cost (March 1965)

	Contingencies	75,000
09	Total Contract Cost	$575,000
30	Engineering and Design	25,000
31	Supervision and Administration	45,000
	Total Project Cost (Federal Funds & Non-Federal Contribution)	$645,500

15. Comparison of Costs

	Document Estimate (Feb. 1939)	Latest Appr. Estimate (Sep. 1964)	Current Estimate (Mar 1965)
Dredging - Channel & anchorages	140,400	500,000	500,000
Contingencies	*	75,000	75,000
Engineering & Design	*	25,000	25,000
Supervision & Administration	*	45,500	45,500
Totals	$140,400	$645,500	$645,500

16. Allocation of Costs

	Document Estimate (Feb. 1939)	Latest Appr. Estimate (Sep. 1964)	Current Estimate (Mar 1965)
Federal			
Dredging	$ 72,900	$432,500	$432,500
Contingencies	*	75,000	75,000
Engineering & Design	*	25,000	25,000
Supervision & Administration	*	45,500	45,500
Total Federal	$ 72,900	$578,000	$578,000

	Document Estimate (Feb 1939)	Latest Apprv. Estimate (Sep. 1964)	Current Estimate (Mar. 1965)
Non-Federal			
Dredging	$ 67,500	$ 67,500	$ 67,500
Public Landing	7,500**	14,000**	14,000**
Total Non-Federal	$ 75,000	$ 81,500	$ 81,500
Total Fed. & Non-Fed.	$140,400(1)	$645,500(1)	$645,500(1)

(1) Exclusive of cost of public landing
*Not broken down in document
**Self-liquidating

SCHEDULE FOR DESIGN AND CONSTRUCTION

17. Construction of the Federal dredging project will be accomplished by contract. The estimated time to construct the project is 7-1/2 months. No restrictions by local people on dredging during the summer months has been requested. The following schedule provides for continuous dredging.

Issue Advance Notice	29 March 1965
Issue Plans & Specifications	8 April 1965
Open Bids	29 April 1965
Award Contract	14 May 1965
Start Construction	1 June 1965
Complete Construction	15 January 1966

18. Funds in the amount of $578,000 were allotted in FY 1965 for construction of the project.

OPERATION AND MAINTENANCE

19. Maintenance of the authorized improvement is the responsibility of the United States. Annual maintenance of the channel and anchorages consists of periodic dredging to restore project depths. The shoaling rate is about 11,500 cubic yards per year. Annual maintenance cost is estimated at $12,500.

BENEFITS

20. The benefits expected to accrue from the improvement of North Cove by dredging an entrance channel and two anchorages, are increased use of the harbor by practically all types and sizes of recreational craft from small outboards to deep keel sailboats. The benefits were not evaluated in the House Document, however, from information supplied by local interests, economic evaluation of the project has been made, based on present use, and anticipated growth in use by the home based fleet and by transferred and transient boating fleets. The following tabulation of benefits has been made: (See inclosed Tables I, II, III, IV, V)

New Boats - Normal Growth	$11,200
New Boats - Immediate	35,900
Transferred Boats	4,100
Transient Boats	5,600
Existing Boats	500
Total	$57,300

21. Annual charges computed in the authorizing document were based on an interest rate of 4-1/2 percent for Federal investment and 5-1/2 percent for Non-Federal investment. At the time of the authorizing document, the estimated cost of the public landing was included in the Non-Federal investment. Current annual charges are computed on a 50-year project life at a Federal and Non-Federal investment rate of 3-1/8 percent. The Non-Federal investment is exclusive of the estimated cost of the public landing which is considered self-liquidating.

Annual Charges

	Federal	Non-Federal	Total
Investment	578,000	67,500	645,500
Project Life	50 Years	50 Years	
Interest Rate	3-1/8	3-1/8	
Interest & Amortization	23,000	2,700	25,700
Maintenance	12,500	0	12,500
Total Annual Charges	$35,500	$2,700	$38,200

22. A comparison of estimated benefits of $57,200 to estimated annual charges of $38,200 yields a benefit-cost ratio of 1.5 to 1.

RECOMMENDATIONS

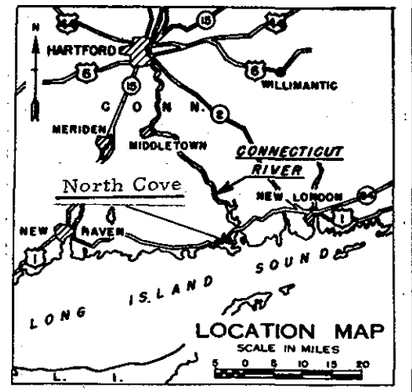
23. The plan of improvement proposed in this design memorandum provides for an entrance channel about 1900 feet in length, 100 feet wide, 11 feet deep at mean low water, to an anchorage of the same depth, about 900 feet long by 650 feet wide, and about 12 acres in area, beyond which is an anchorage 6 feet deep, 1150 feet long, 650 feet wide and 17 acres in area, extending nearly to the west shore.

24. This project plan will serve adequately the needs of the present and prospective navigation interests in North Cove and is economically justified. It is recommended that the project be constructed as described.

Incls
Map
Tables I, II, III, IV, V

CORPS OF ENGINEERS

U.S. ARMY



CONNECTICUT RIVER

N

FILL(1938)

N O R T H

C O V E

GAY(1938)

750'

1150'

30φ Pt. "Stone Bound"

200'

100'

11' Channel

100'

6' Anchorage

11' Anchorage

650'

350'

600'

150'

SUBMERGED ROCK PILES

ROAD

Town of Saybrook

CROMWELL PL

TALCOTT (1938)

NORTH

LOVE

Town of Saybrook

Saybrook Fort Park

PROJECT PLAN

11' Entrance Channel - 100' Wide
11' Anchorage - 12 Acres
6' Anchorage - 17 Acres

U.S. Army Engineer Division, New England
Corps of Engineers Waltham, Mass.

CONN. RIVER BELOW HARTFORD,
OLD SAYBROOK, NORTH COVE,
CONN.

General Map
To accompany Design Memo.dtd,3/65

TABLE I BENEFITS TO RECREATIONAL BOATING
NEW BOATS - NORMAL GROWTH

Type of Craft	Length (feet)	No. of Boats	Depreciated Value Average $	Depreciated Value Total $	Percent Return Ideal	Percent Return % of Ideal Pres.	Percent Return % of Ideal Ftr.	Percent Return Gain	Value $	On Cruise(120 day season) Avg. Days	On Cruise(120 day season) % of Season	On Cruise(120 day season) Value $
Recreational Fleet												
Outboards	10-20	5	1,000	5,000	13	-	100	13	650			
Inboards	10-20	5	1,500	7,500	11	-	100	11	825			
Cruisers	15-30	5	4,500	22,500	9	-	100	9	2,025			
	31-50	5	11,000	55,000	8	-	100	8	4,400	12	10	440
	51-60	3	25,000	75,000	8	-	100	8	6,000	24	20	1,200
Aux. Sail	15-30	6	4,500	27,000	9	-	100	9	2,430	12	10	243
	31-40	5	15,000	75,000	8	-	100	8	6,000	18	15	900
	41-60	3	22,000	66,000	8	-	100	8	5,280	24	20	1,056
Sailboats	10-20	10	2,000	20,000	12	-	100	12	2,400			
	21-30	5	5,000	25,000	11	-	100	11	2,750			
TOTALS		52		$378,000					$32,760			$ 3,839
									- 3,839			
									$28,921	say $29,000 (.3866)		$11,211
											Say	$11,200

TABLE II BENEFITS TO RECREATIONAL BOATING - NEW BOATS - IMMEDIATE

Type of Craft	Length (feet)	No. of Boats	Depreciated Value Average $	Depreciated Value Total $	Percent Return Ideal	Percent Return % of Ideal Pres.	Percent Return % of Ideal Ftr.	Percent Return Gain	Value $	On Cruise (120 day season) Avg. Days	On Cruise (120 day season) % of Season	On Cruise (120 day season) Value $
Recreational Fleet												
Outboards	10-20	15	1,000	15,000	13	-	100	13	1,950			
Inboards	10-20	12	1,500	18,000	11	-	100	11	1,980			
Cruisers	15-30	8	4,500	36,000	9	-	100	9	3,240			
	31-50	8	11,000	88,000	8	-	100	8	7,040	12	10	704
	51-60	2	25,000	50,000	8	-	100	8	4,000	12	10	400
Aux. Sail	15-30	7	4,500	31,500	9	-	100	9	2,835			
	31-40	6	15,000	90,000	8	-	100	8	7,200	12	10	720
	41-60	2	22,000	44,000	8	-	100	8	3,520	12	10	352
Sailboats	10-20	15	2,000	30,000	12	-	100	12	3,600			
	21-30	5	5,000	25,000	11	-	100	11	2,750			
TOTALS		80		$427,500					$ 38,115			$ 2,176
									- 2,176			
									$35,939	Say $35,900		

TABLE III BENEFITS TO RECREATIONAL BOATING-TRANSFERRED BOATS

Type of Craft	Length (feet)	No. of Boats	Depreciated Value Average $	Depreciated Value Total $	Percent Return Ideal	Percent Return % of Ideal Pres.	Percent Return % of Ideal Ftr.	Percent Return Gain	Value $	On Cruise(120 day season) Avg. Days	On Cruise(120 day season) % of Season	On Cruise(120 day season) Value $
Recreational Fleet												
Outboards	10-20											
Inboards	10-20	15	1,500	22,500	11	90	100	1.1	248	12	10	25
Cruisers	15-30	10	4,500	45,000	9	90	100	.9	405	12	10	41
	31-50	9	11,000	99,000	8	90	100	.8	792	12	10	79
	51-60	8	25,000	200,000	8	90	100	.8	1,600	24	20	320
Aux. Sail	15-30											
	31-40	6	15,000	90,000	8	90	100	.8	720	12	10	72
	41-60	6	22,000	132,000	8	90	100	.8	1,056	24	20	210
TOTALS		54		$588,500					$4,821			$747
									- 747			
									$4,074	Say $4,100		

TABLE IV BENEFITS TO RECREATIONAL FLEET-EQUIVALENT TRANSIENT FLEET

Type of Craft	Length (feet)	No. of Boats	Depreciated Value Average $	Depreciated Value Total $	Percent Return Ideal	Percent Return % of Ideal Pres.	Percent Return % of Ideal Ftr.	Percent Return Gain	Value $	On Cruise (120 day season) Avg. Days	On Cruise (120 day season) % of Season	On Cruise (120 day season) Value $
Recreational Fleet												
Outboards	10-20											
Inboards	10-20											
Cruisers	15-30	3	4,500	13,500	9	70	100	2.7	365			
	31-50	3	11,000	33,000	8	70	100	2.4	792			
	51-60	3	25,000	75,000	8	70	100	2.4	1,800			
Aux. Sail	15-30											
	31-40	3	15,000	45,000	8	70	100	2.4	1,080			
	41-60	3	22,000	66,000	8	70	100	2.4	1,584			
TOTALS		15		$232,500					$5,621			
									Say $5,600			

TABLE V BENEFITS TO RECREATIONAL BOATING-EXISTING FLEET

Type of Craft	Length (feet)	No. of Boats	Depreciated Value Average $	Depreciated Value Total $	Percent Return Ideal	Percent Return % of Ideal Pres.	Percent Return % of Ideal Ftr.	Gain	Value $	On Cruise (120 day season) Avg. Days	On Cruise (120 day season) % of Season	On Cruise (120 day season) Value $
Recreational Fleet												
Outboards	10-20	15	1,000	15,000	13	90	100	1.3	195			
Inboards	10-20	5	1,500	7,500	11	85	100	1.65	124			
Sailboats	10-20	6	2,000	12,000	12	90	100	1.2	144			
TOTALS		26		$34,500					$463	Say $500		